

L 44813-64 ER(1) IJ(c) AT
ACC NR: AP6032020

SOURCE CODE: UR/0386/66/004/006/0213/0216

AUTHOR: Kitayeva, V. F.; Osipov, Yu. I.; Sobolev, N. N.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy Institut Akademii nauk SSSR)

TITLE: Electron temperature in the electric discharge used for the argon ion laser

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniya, v. 4, no. 6, 1966, 213-216

TOPIC TAGS: gas laser, argon, electron temperature, electron density, electric discharge

ABSTRACT: This is a continuation of an earlier investigation (Dokl. AN SSSR, in press) of the charged-particle concentration and the gas temperature in argon under conditions typical of the operation of a continuously operating ionic argon laser. The results indicated that the decisive influence on the ion motion in the discharge column is exerted by the drift of the ions to the wall and their recombination. The present investigation was devoted to a determination of the electron temperature in a discharge of this type. Measurements were made of the half-width of the Ar II lines radiated transverse to the discharge in a tube of 2.8 mm diameter and ~40 cm length, with a bypass channel. The gas pressure ranged from 0.21 to 0.62 Torr and the current density from 150 to 350 a/cm². The results show that the width of the Ar II line increases with increasing current density. The width Δ_{11} of the line

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radiated transverse to the channel exceeds the width $\delta\lambda_{1\parallel}$ of the line radiated along the discharge by a factor $\sim 1.5 - 2$. From the values of $\delta\lambda_{1\parallel}$ the authors determined the "effective temperature" of the ions transverse to the discharge and the electron temperature T_e . T_e increases from 5×10^4 to 9×10^4 (for $P_{Ar} = 0.37$ Torr) when the current density rises from 150 to 350 a/cm², and is expected to reach 13×10^4 K at $j = 550$ a/cm². It follows from the results that the increase of the intensity of the spontaneous radiation of the Ar II lines and the increase of the power of the coherent radiation of the laser with increasing current density in the capillary are due primarily to the increase in the electron temperature. The electric-conductivity cross sections (Q_0) calculated from the electron temperature are equal to 8×10^{-16} cm² at 5×10^4 K and 6×10^{-16} cm² at 9×10^4 K. The electron density N_e is also calculated from the temperature and agrees with the values experimentally determined from the half-width of the hydrogen line H_β. It is concluded that the investigations have yielded the basic characteristics of the discharge used for the argon ionic laser, which are of undisputed interest for the explanation of the mechanism that ensures population inversion. Although the increase of T_e with current density is not subject to doubt, the absolute values of the temperature must be verified by other independent methods. The authors thank A. A. Rukhadze for valuable discussions and advice. Orig. art. has: 1 figure, 2 formulas, and 1 table.

SUB CODE: 20/ SUBM DATE: 17Jun66/ ORIG REF: 004

L
Card 2/2

ACC NR:AP7005582

SOURCE CODE: UR/0020/67/172/002/0317/0319

AUTHOR: Kitayeva, V. Z.; Osipov, Yu. I.; Sobolev, N. N.ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences, SSSR
(Fizicheskiy institut Adademii nauk SSSR)

TITLE: Spectroscopic investigation of gas discharge for argon ion lasers

SOURCE: AN SSSR. Doklady, v. 172, no. 2, 1967, 317-319

TOPIC TAGS: population inversion, argon ion laser, gas discharge,
~~DISCHARGE TUBE, GAS DISCHARGE SPECTROSCOPY, ION TEMPERATURE~~ABSTRACT: Two types of discharge tubes were used in the investigation: 1) tubes 1-3 mm wide, with capillaries approximately 300 mm long between the bulbs, for use with cw lasers, and 2) tubes 5 mm wide and 95 cm long with hot electrodes, for use with pulsed lasers. For tubes of the first type, the temperatures of the Ar ions and neutral atoms were derived from the measured width of their respective spectral lines; the ion concentrations were derived from the Stark effect exhibited by the H_α line of the hydrogen traces. The current densities were about 300 amp·cm⁻²; ion concentrations, about 3.5 (10¹³) cm⁻³; atom temperatures, about 2500°K (rising with current density); and ion temperatures, about 2.5 times greater than the

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UDC: 535.89

ACC NR: AP7005582

atom temperatures. For tubes of the second type, an He-Ar (10:1) mixture was used. Current was applied in 4-usec, 6-10-kv pulses, yielding a density of approximately $500 \text{ amp} \cdot \text{cm}^{-2}$. The atom temperatures and ion concentrations were obtained by comparing the widths of the H_α and H_β lines and by using an assumed ratio for the contribution of the Stark and Doppler effects. Temperatures from 2000 to 6000°K and concentrations from 0.8 to $20 (10^{13}) \text{ cm}^{-3}$ were obtained. Electron temperatures, which are required for population inversion, were extremely difficult to determine in the investigated case. Orig. art. has: 1 figure and 2 tables. [JM]

SUB CODE: 20/ SUBM DATE: 22Mar66/. ORIG REF: 001/ OTH REF: 001/
ATD PRESS: 5116

Card 2/2

CHUPAKHIN, O.N.; PUSIIKARHEVA, Z.V.; KOKOSHKO, Z. Yu.; KITAYKVA, V.O.

Reaction and derivatives of quinaldine. Part 5: Dehydration
of 2-quinolylpropanediol. Zhur. ob. khim. 34 no.11:3783-3785
N '64 (MIRA 18:1)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.

ACCESSION NR: AM4023354

8/0299/64/000/004/M017/M018

SOURCE: RZh. Biologiya, Abs. 4M124

AUTHOR: Kitayeva, V. I.

TITLE: Dermatoplasty of ulcers following radiation therapy

CITED SOURCE: Sb. Materialy obz. nauchno-prakt. konferentsii po onkol. Vyyp 2.
Ivanovo, 1963, 133-134

TOPIC TAGS: plastic surgery, ulcer dermatoplasty, radiation therapy, bone ulcer,
skin graft acceptance, radiation ulcer, radiation burn

TRANSLATION: The author describes two cases in which skin grafts from the thigh
area were used to cover a 3x3 cm ulcer in the sacral region and a 2.5x1.5 cm ul-
cer in the temporal bone region. After excision of the ulcer in the latter case,
the skin flap was removed together with the periosteum. It was established that
the use of plastic surgery in treatment of chronic ulcers provides positive re-
sults. Periosteal defects do not prevent an acceptance of the skin graft. N.S.

DATE ACQ: 16Mar64

SUB CODE: AM

ENCL: 00

Card 1/1

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

GORSKAYA, A.I.; BOLOTSKAYA, O.P.; KITAYEVA, V.N.

Characteristics of organic matter from deposits of the ancient
Yoldian Sea. Trudy VNIGRI no.174:61-47 '61. (MIRA 14022)

(Edov District--Clay)
(Bitumen)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

BOL'SHAKOV, Anatoliy Stepanovich; SARIN, Valeriy Ivanovich;
SHVAYNSHTEYN, Boris Simonovich; PONOMAREV, V.S., inzh.,
retsenzent; ZAZOVSKIY, D.G., inzh., retsenzent; MAKAROV,
M.S., inzh., retsenzent; POPOV, G.V., inzh., retsenzent;
KURBATOV, A.I., retsenzent; KITAYEVA, Z.A., inzh.,
retsenzent; SDOBNIKOV, Ye.P., retsenzent; KOVALEV, A.K.,
inzh., retsenzent; KESAREV, A.P., inzh., retsenzent;
KISELEVA, N.P., inzh., red.; GROMOV, S.A., kand. tekhn.
nauk, red.; SHCHEGBACHEVICH, O.S., inzh., red.; USENKO, L.A.,
tekhn. red.

[Shunting diesel locomotives] Manevrovye teplovozy. Moskva,
1962. 383 p. (MERA 15:6)
(Diesel locomotives)

KITAYEVICH, Boris Yefimovich; TREGUBOVA, T.A., apetsred.; PRISHMAN, Z.S.,
Tekhn. red.; KOBILAKOV, O.I., tekhn. red.

[Radio traffic] Radioteknicheskaya literatura. Leningrad, Izd-vo "Morskoi transport",
1959. 194 p. (MIRA 12:12)
(Radio in navigation)

SIMITSIN, Mikhail Timofeyevich; KITAYEVICH, B.Ye., red.; SEMENOV, S.A.,
red.izd-va; LAVRUMOVA, N.B., tekhn.red.

[Radio communications at sea] Ekspluatatsiya radiosvieszi na
morskem flote. Izd.2., perer. i dop. Moskva, Izd-vo "Morskoi
transport," 1959. 308 p. (MIRA 12:11)
(Radio--Installation on ships) (Radio in navigation)

KOVAL'CHUK, Viktor Semenovich. Prinimal uchastiye KITAYEVICH, B.Ye.,
prepodavatel'; BORODIN, N.I., kand. tekhn. nauk, dotsent, retsen-
zent; REVUT, D.B., inzh., retsenzent; CHERULANOV, V.V., inzh., re-
tsenzent; TRUEBAKOV, A.A., inzh., spets. red.; FRISHMAN, Z.S., red.
izd-va; KOTLYAKOVA, O.I., tekhn. red.

[Fundamentals of radio engineering] Osnovy radiotekhniki. Lenin-
grad, Izd-vo "Morskoi transport," 1961. 279 p. (MIRA 14.10)
(Radio) (Radio in navigation)

KITAYEVICH, Boris Yefimovich; FRISHMAN, Z.S., red. izd-va; KOTLYAKOVA,
O.I., tekhn. red.

[Radio communications] Radiootmen. Izd.2., ispr. i dop. Lenin-
trad, Izd-vo "Morskoi transport," 1962. 220 p. (MIRA 15:7)
(Radio in navigation)

KITAYEVICH, I.Ye., starshiy prepodavatel'

Relative disposition of two planes. Trudy MIMESK 4 no.1:123-128 '59.
(Geometry, Projective) (MIRA 13:10)

KITAYEVICH, Kh.Sh.

New method for cutting fringes. Tekst. prom. 23 no.10:74-75
O '63. (MIRA 17:1)

1. Pomoshchnik mastera galantereynogo tsekha trikotazhnay
fabriki "Viliya" Litovskogo soveta narodnogo khozyaystva.

DMITRIYEV, A.I., doktor veterinarnykh nauk; KITAYEVICH, Ye.I., veterinarnyy vrach.

Etiology of bronchial pneumonia in swine after plague inoculation by crystal violet vaccine. Veterinariia 33 no.3:51-52 Mr '56.
(MLRA 9:5)

1. Leningradskiy sel'skokhozyaystvennyy institut.
(PNEUMONIA) (HEMORRHAGIC SEPTICEMIA)

RJ096

S/058/60/000/006/003/040
A005/A001

26.2340

Translation from: Referativnyy zhurnal, Fizika, 1960, No. 6, p. 29, # 13140

AUTHORS: Sinel'nikov, K.D., Zeydlitz, P.M., Grishayev, I.A., Kitayevskiy,
L.Kh., Akhiyezer, A.I., Faynberg, Ya.B., Selivanov, N.P., Khizh-
nyak, N.A.

TITLE: An Electron Accelerator With 3.5 Mev Output Energy

PERIODICAL: Tr. Sessii AN UkrSSR po mirn. ispol'zobaniyu atomm. energii, Kiyev,
AN UkrSSR, 1958, pp. 16-23

TEXT: The authors describe a linear electron accelerator with a traveling wave of 3.5 Mev energy. A waveguide loaded with disks is used as accelerating system. The necessary law of wave phase velocity variation is brought about by variation of the diameter of the apertures in the disks. The 280-cm long waveguide is divided into three sections. In the first section, the phase velocity is varied from 0.5 to 0.97 c; in the second and third section it is equal to 0.98 and 0.99 c respectively. The electron equilibrium phase increases during the acceleration process; its initial value is equal to 45° and is chosen according to the optimum capture condition. The computational value of the h.f. power at the

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81-096
S/058/60/000/006/003/040
A005/A001

An Electron Accelerator With 3.5 Mev Output Energy

accelerator input is 900 kw; the accelerator field intensity amounts hereat to 16.5 kv/cm. The accelerator output power (about 600 kw) is absorbed in a steel load with water cooling; approximately 300 kw are dissipated in the waveguide walls. An additional axisymmetrical magnetic field with an intensity up to 400 Gs is developed by solenoids for focusing the electrons along the waveguide axis. An electron gun with three electrodes serves as electron source; it operates pulsing synchronously with the magnetron generator and provides for a beam of 5-6 mm diameter at the accelerator input. The output parameters of the accelerator measured are: the current is about 20-30 ma in the pulse of 2 μ sec duration, the average current is about 20-30 μ a; the beam diameter is 3-4 mm with the divergence angle of $7 \cdot 10^{-4}$ - $3 \cdot 10^{-3}$ radian; the energy beam half-width is about 8%.

ASSOCIATION: Fiz.-tekhn. in-t AN UkrSSR (Physico-Engineering Institute of the Ukrainian Academy of Sciences)

A.P. Fateyev

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

24.6730

3/058/63/000/001/015/120
A062/A101

AUTHORS: Sinel'nikov, K. D., Grishayev, I. A., Grizhko, V. M., Pismen, A. N., Zykov, A. I., Kitayevskiy, L. Kh.

TITLE: A 30 MeV energy linear travelling-wave electron accelerator

PERIODICAL: Referativnyy zhurnal, Fizika, no. 1, 1963, 39 - 40, abstract 1A374
(In collection: "Elektron. ustanovki." Tomsk, Tomskiy un-t, 1961,
3 - 9)

TEXT: The authors describe a 30 MeV linear electron accelerator designed at the Physical-technical Institute of the Academy of Sciences of the Ukrainian SSR. The accelerator consists of two sections connected with each other - the injector section and the main section (with a constant wave phase speed); the length of the main section is 2.8 m, the value $ka = 2.48$ (k - wave vector, a - wavelength radius). The two sections are energized by one klystron power amplifier, excited by a magnetron generator. The power dissipated in the main section and in the output load is ~10 Mw (in the load 3.3 Mw); the field intensity is then 150 kV/cm. The accelerating system is composed of separate resonators; the

Card 1/2

VERZHIKOVSKIY, Anatoliy Pavlovich; GABIS, Nikolay Vladimirovich;
KITAYEV, Nikolay Mikhaylovich; TMYANKIN, Ivan Ignat'yevich;
KHORBENKO, I.G., kapitan 2 ranga, red.; KUZ'MIN, I.F., tekhn.
red.

[Concise dictionary on radio electronics] Kratkii slovar' po
radiotekhnike. Moskva, Voenizdat, 1964. 255 p.
(MIRA 17:2)

KITAYEVICH, A.Ye.; TOLCHINSKIY, V.A.

Case of spinal meningitis of otogenous origin. Zhur. ush., nos.
i gorl. bol. 23 no. 5:86-87 S-0'63 (MIRA 17:3)

1. Is otorinolaringologicheskogo otdeleniya (zav. - Ya.V. Bo-
gatyrev) Dnetskoy tsentral'noy klinicheskoy bol'nitay.

KITAYEVICH, A.Ye.

Incidence of acute and chronic otitis media among the population
of Makayovka, Zhur.ush., nos. 1 gorl. bol. 24 no.5:1.-17 S-0 '64.
(MIRA 18:3)
1. Is otorinolaringologicheskogo otdeleniya Gorodskoy bol'niцы
No.37 Donetskaya (glavnnyy vrach - Z.O. Moreynis).

KITAYGORA, T. A.

COUNTRY : USSR
CATEGORY : Plant Physiology. Water Conditions.

ART. JOUR. : RzhBiol., No. 3 1959, No. 10615

AUTHOR : Dvoretskaya, Ye. I., Matserova, N. I., Kitaygora, T. A.
INST. : Academy of Sciences USSR
TITLE : On the Characteristics of Water Metabolism and Drought
Resistance in Some Tree and Shrub Species.

CONT. P.B. : V. M. Panigutii, N. A. Makarova, N. S. Leksin,
1957, 42-54
ABSTRACT : In the conditions of a moister climate in the forest
steppe zone of Ukraine, the intensity of transpiration was
higher and osmotic pressure lower than in the same woody
plants in the arid conditions of Stalingrad district.
Black locust had the greatest heat tolerance; common ash
and Pennsylvania ash - the lowest. The greatest water
holding ability was observed in the leaves of horway
maple and common ash; the smallest - in the leaves of

APPENDIX 1/2

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KITAYGORODSKAYA, O.D., professor; KUSTAREVA, K.S., nauchnyy sotrudnik;
TALNOVA, I.K., nauchnyy sotrudnik

Ultraviolet rays in complex therapy of acute rheumatism in children.
Pediatriia no.5:44-50 8-0 '54. (MIR 7:12)

1. Iz detskogo otdeleniya (zav. prof. O.D.Kitaygorodskaya) Nauchno-issledovatel'skogo instituta fizioterapii (dir. prof. A.N.Obrosov)
(RHEUMATIC FEVER, in infant and child,
ther., ultraviolet rays)
(ULTRAVIOLET RAYS, therapeutic use,
rheum. fever in child.)

KITAYGORODSKAYA, O.D., professor (Moskva)

Constipation in children. Fel'd. i skush. 21 no.12;8-12 D '56.
(CONSTIPATION) (MLRA 10:1)
(CHILDREN--CARE AND HYGIENE)

KITAYGORODSKAYA, O.D., professor; KUPER, S.G.; BOSIK, R.N.; GEL'MAN, A.S.;
ROZANOVA, A.M.; KHEDDEL', A.S.

Use of diathermia in the compound therapy of pneumonia in children.
Pediatriia 39 no.1:74-75 Ja-Y '56. (MLR 10:1)

(PNEUMONIA, ther.
diathermy, in child.)
(DIATHERMY, in various dis.
pneumonia in child.)

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

~~SECRET~~

KITAYGORODSKAYA, O.D., prof. (Moskva)

Role of vitamins in the prevention of diseases in children. Fel'd.
1 skush. 22 no.10:57-59 O '57. (MIRA 11:1)
(VITAMINS)

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CIA-RDP86-00513R000722920002-7"

KITAYGORODSKAYA, O.D., prof.

It happens in children. Zdorov'e 4 no.1:25-26 Ja '58. (MIRA 11:2)
(DIGESTION) (CHILDREN--NUTRITION)

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKAYA, O.D., prof.

Attacks of rheumatic fever. Zdorov'e 5 no.3:14-15 Mr '59.

(RHEUMATIC FEVER)

(NIRA 12:3)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKAYA, O.D., prof.

Chicken pox. Zdorov'e 5 no. 10:18-19 0 '59.
(CHICKEN POX)

(MIRA 13:2)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

KITAYGORODSKAYA, O.D., prof. (Moskva)

Diseases of the kidneys and urinary tract in children. Yel'd. i akush.
24 no.3:15-20 Mr '59.

(MIRA 12:4)

(URINARY ORGANS--DISEASES)
(CHILDREN--DISEASES)

KITAYGORODSKAYA, O.D., prof.

Goat's milk. Zdorov'e 7 no. 4:31 Ap '61.
(GOAT'S MILK)

(MIRA 14:4)

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYCOLODSKAYA, O.D., prof. (Moskva)

Pneumonia in children. Fel'd. i akush. 26 no.12:9-15 D '61.
(MIRA 14:12)
(PNEUMONIA)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKAYA, O.D., prof. (Moskva)

Exudative diathesis. Fel'd. 1 akush. 26 no.11:54-56 N '61.
(DIATHESIS) (MIA 15:2)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKAYA, O.D., prof.

Overheating. Zdorov's 5 no.8:30 Ag '59.
(HEATSTROKE)

(MIRA 13:8)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKAYA, O.D., prof.

Ricketts. Zdorov's 6 no.12114-15 D '60.
(RICKETS)

(MIRA 13:12)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

KITAYGORODSKAYA, O.D., prof. (Moskva)

Epidemic hepatitis (Botkin's disease) in children. Pel'd. i akush.
25 no.4:26-32 Ap '60. (MIRA 14:5)
(HEPATITIS, INFECTIONS)

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKAYA, O.D., prof. (Moskva)

Conditioning of the child. Fel'd. i akush. 25 no. 8134-39 Ag '60.
(CHILDREN—CARE AND HYGIENE) (MIRA 13:8)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

KITAYGORODSKAYA, O.D., prof.; VAYNTSVAIG, G.Ye., red.; LYUDKOVSKAYA,
N.I., tekhn. red.

[*Digestive disorders in schoolchildren*] Rasstroistva pishchevareniiia u detei shkol'nogo vozrasta. Moskva, Medgiz, 1961. 87 p.
(MIRA 15:2)
(DIGESTIVE ORGANS--DISEASES) (CHILDREN--NUTRITION)

KITAYGOLODSKAYA, O.D., prof.

It would seem to be without cause.... Zdorov'e 7 no.11:12-13 N '61.
(FOOD ALLERGY) (CHILDREN-DISEASES) (MIRA 14:11)

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKAYA, O.D., prof. (Moskva)

Colienteritis in children. Fel'd. i akush. 27 no.8:8-10 Ag'(2.
(*ESCHERICHIA COLI*) (ALIMENTARY CANAL—DISEASES)
(MIRA 16:8)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

KITAYGORODSKAYA, Ol'ga Davydovna, prof.; MARTYNSON, A.S., red.

[Manual of children's diseases] Uchebnik detskikh boleznei. Moskva, Medgiz, 1963. 430 p. (MIRA 17:6)

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

LANDAU, L., akademik, laureat Leninskoj premii; KITAYGORODSKIY, A., prof.

Motion, what is it? Tokh.mol.30 ne.11:3-4 '62. (MIRA 16:9)
(Motion)

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

KITAYGORODKIJ, A. A.

Institute of Elemento-Organica Compounds, Moscow

"Some Physical Problems of Organic Crystals."

Paper submitted at Leningrad
Program of the Conference on the Non-Metallic Solids of Mechanical Properties.
May 19 - 26, 1958.

KITAYGORODSKIY, A.B.

Time relay for testing machines. Zav.lab. 23 no.31368 '62.

1. Institut mekhaniki AN USSR.
(Testing machines)

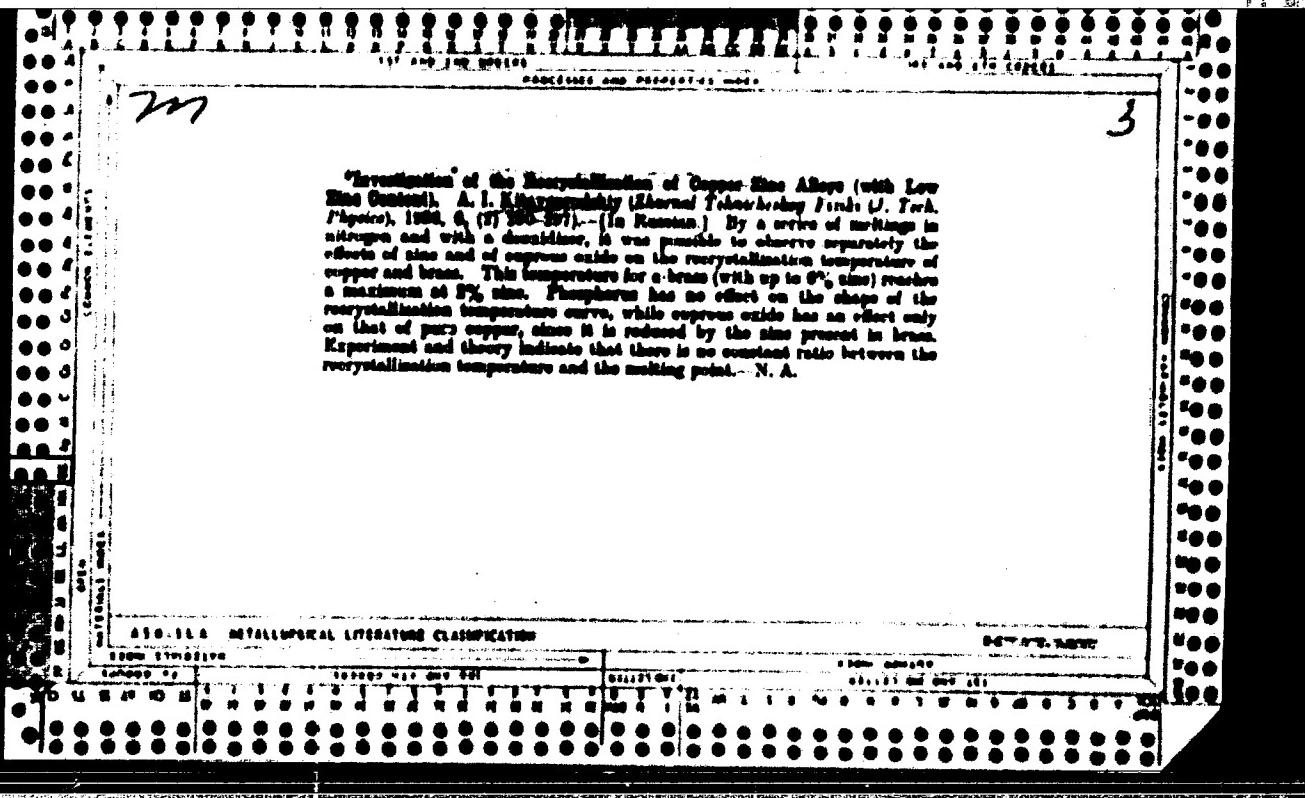
(MIRA 1514)

153
Z

444. Structure of Glycine. A. Knausovsky. *Acta Physicochim. S. S.* pp. 748-754, 1936. In German.—A new X-ray study of glycine is described. The following data are given for the monoclinic unit cell: $a = 8.08$, $b = 11.9$, $c = 8.49$ Å, $\beta = 111^\circ 34'$; space group = $P\bar{1}/n$; 4 mol. of $\text{NH}_2\text{-CH}_2\text{-COOH}$ per unit cell. These values agree with those of Bergmann and Lenz [see Abstract 934 (1931)], but the present author disagrees with the molecular arrangement put forward in the earlier work and new atomic coordinates are calculated. It is pointed out that if the comparison between calculated and observed intensities is restricted to the (AM) and (OM) planes both structures give fair agreement, but when the comparison is extended to include general (AM) planes only the structure put forward by the present author gives calculated intensities in agreement with those observed. The following
VOL. XL.—4.—1937.
Interatomic distances are given, C—C = 1.47, C—N = 1.49, C—O
= 1.39 Å. J. L.

M
2

"The Recrystallization of Copper-Zinc Alloys with Zinc Content up to 7 Per Cent. Al. Kitagurobiki [Taka]. *Transl. U.S.A.R.*, 1938, 2, (1), 20-30; *Arz. Met.,* 1936, [A], 28, 579).—[In German.] Alloys were prepared containing up to 7% zinc by melting copper and zinc together (a) in purified nitrogen, and (b) under charcoal in air, with subsequent dissolution. Recrystallization was determined on a 97.5% cold-worked strip by an X-ray method. At about 2% zinc the rate is a minimum as shown both by time and by temperature curves. The speed is not affected by 0.2-0.4% phosphorus nor by copper sulfate which markedly inhibits recrystallization in pure copper. The oxide is apparently immediately reduced by zinc. Theoretically, recrystallization depends on the number of nuclei and rate of growth, so that it is unnecessary to assume the formation of a special constituent at 2% zinc. Theoretical investigation of recrystallization is very difficult. The practical rule (recrystallization temperature=melting point) is exact, has no theoretical or experimental basis for the alloys investigated.—R. (1).



Structure of amorphous carb. A. I. Knopwood
J. Phys. Chem. (U. S. S. R.) 8, 766-80 (1966).—X-ray
data gave for the elementary cell $a = 8.18$, $b = 11.8$, $c =$
 8.48 Å, $\beta = 111^{\circ}28'$. A structure is proposed with the
dimensions C-C = 1.47, C-N = 1.4 and C-O = 1.39 Å.
and it agrees well with the exper. x-ray data and interatomic
P. H. Rathmann

AMSLA METALLURGICAL LITERATURE CLASSIFICATION

BC

A-1

Interference curves on X-ray rotation photographs. A. Krasnopol'skij. Tech. Phys. USSR, 1936, 8, 363-380). - Interference curves have been classified and their equations determined. It is shown that with their use four oscillation photographs are sufficient to determine the Bravais lattice and that a special camera is not necessary. V. J. L.

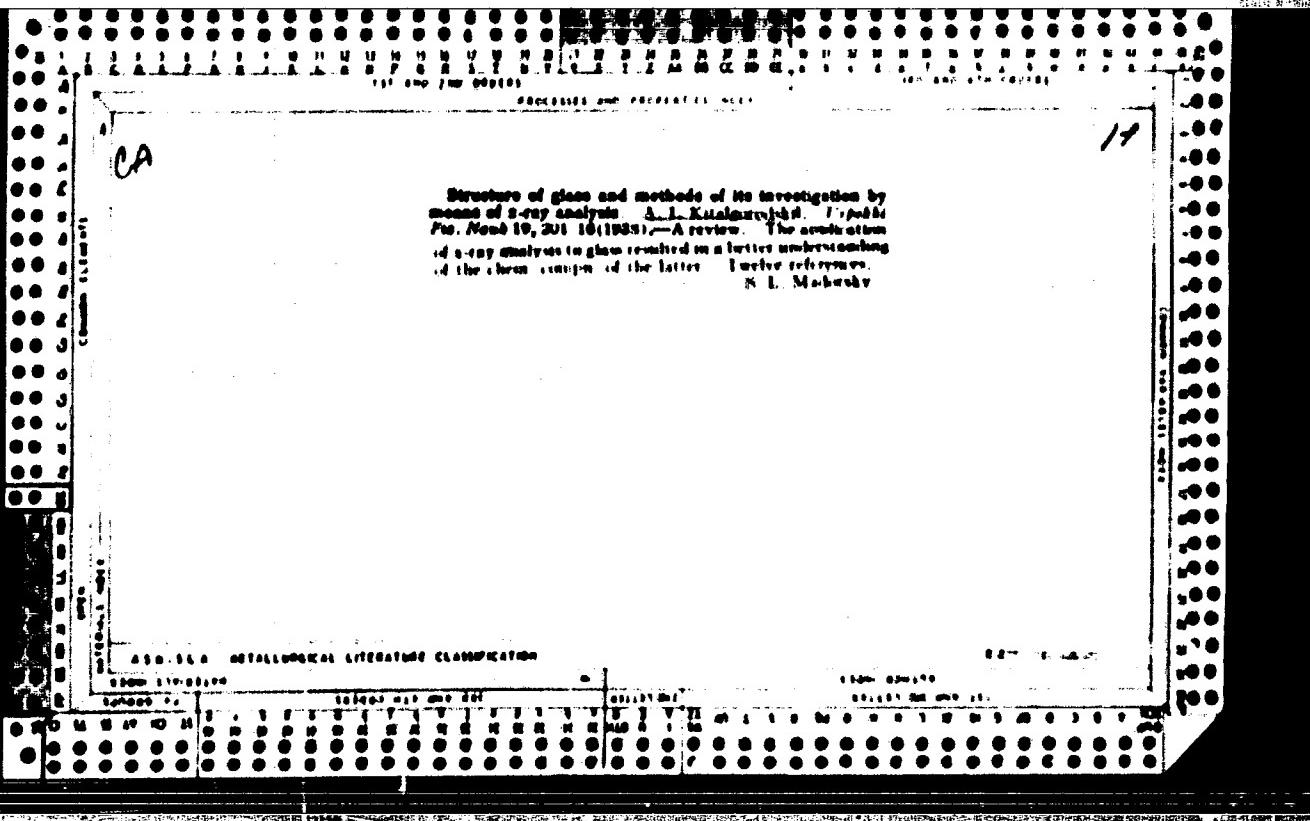
AB-1A METALLURGICAL LITERATURE CLASSIFICATION

INTERFERENCE CURVES ON THE X-RAY PATTERNS OF CRYSTAL
ROTATION. A. I. Kitaigorodskii. Sov. Phys. Usp. 11, No. 8, p.
8, 436-440 (1968). Four oscillation diagrams are sufficient
for data of the Bravais group. A special unit cell is not
required for the data. In the majority of cases three
oscillation diagrams about the fundamental crystallographic
axes are sufficient to determine the translation group.

John F. Cook

31

DO NOT DESTROY LITERATURE CLASSIFICATION



Technique of Raman spectrum analysis. Methodical treatment of the results of X-ray data. A. I. Kostylev, V. M. Kostylev, J. Appl. Phys., 50, (U. S. S. R.) 9, 1973-80 (1979); id. C. A. Muller, J. Appl. Phys., 50, 1973-80 (1979). Characteristics of the absorption and dispersion factors for the Patterson series and the data of the steps in the Fourier series are discussed. Authors of these manuscripts: A. I. Kostylev and V. M. Kostylev, 1973-80. The laboratory physical and chemical data on silver cyanotetrate were used: $a = 0.9 \text{ \AA}$, $b = 0.41 \text{ \AA} = 55.0^\circ$; the crystals are monocrystalline; $\theta = 100-150^\circ$, transmission process space group: $\bar{A}m\bar{a}$ (C_2), 2 mm, 2° zone axis, degree of closure: 0.2, the Ag-O distance is 1.9 Å; C=O, 1.30; C=C, 1.47; C=N 1.48. Complete data on structural factors as dried, by the Least and Patterson methods, on the plasmon effect, etc., are given. P. N. Rathman.

Moscow State Pedagogical Inst., Moscow.

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYOUNICKIY, A. I.

"Investigation of the Structure of Amino-acetic Silver," Zhur. Eksper. i Teoret Fiz., 9, No. 9, 1939.

Dept. of Photobiology, AU Inst. of Experimental Medicine, Moscow.

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

Klif Vuchinskij, A. I., ed.

Reference book on X-ray analysis. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry. 1940.
315 p. (54-5480)

QC481.X53

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKIY, A. I.

"On Organometallic Compounds of Mercury, 31, X-ray Study of the Structure of
 $C_2H_2HgCl_2$," Iz. Ak. Nauk SSSR, Otdel. Khim. Nauk, No. 2, 1945.

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

CA

2

Close packing of molecules in crystals of organic compounds. A. M. Kitaigorodskii. J. Phys. (U.S.S.R.) v. 11, p. 21 (1948). Investigations of the structure of naphthalene derivatives, results will be published later, lead to the conclusion that the shape of these as well as of all other simple and many complex molecules in the benzene and naphthalene series is similar to the shape of a truncated ellipsoid. If the mutual location of the ends is fixed by the requirements of closest packing, an analysis of the elements of symmetry leads to a layer with a coordination no. of 6. A coordination no. of 12 is also possible. By using the principle of closest packing and knowing the dimensions of the ellipsoid it is possible to rule the dimensions of the elementary cell, or, at least, the dimensions of one of the sections and the orientation of the ends. Thus, the method can be used in structure analysis to rough out the features of the structure being investigated.

Frank Casset

000 000 METALLURGICAL LITERATURE CLASSIFICATION

Topological (dyadic) groups of molecular crystals, A. I. Kitaigorodskii, Zher. Fiz. Khim., (J. Phys. Chem.) 16, 662 (1942). For the structure analysis of organic compounds, the description of the mol. units in the lattice parameter cell is of particular importance. A chain, mol. is defined as such a structure by the postulate that the forces by which such a unit is held together must be greater than the forces mutually acting between the units. Such units form in the topological meaning of the word "groups" which are the fundamental ingredients of the whole structure, with a distinct symmetry of their own, the elements of which are distinct symmetry operations. This symmetry is characteristic for the space group which is deduced by the method of x-ray diffraction. The topological problem of how such units are defined in one or the other of the 230 space groups of Bravais' group theory of possible crystal lattice types was first solved by E. Wignerberg (Z. Krist., 52, 612 (1933); J.A. 20, 2004, 22, 4114) in tables of the possible atom configurations in the space groups. He created the word "dyadic" for such a structural unit and combined it with the understanding of the chem. units, by the definition that a dyadic is an atom group in which every atom is combined with neighbouring atoms in it by stronger forces than those that join it to atoms not belonging to the same group. A second group type called "isomeric" (ides) is deduced, by the definition that in each of the given particles with particles of the same group, (and yet-

distorted operations) at a coincidence with particles of another type that does not have in common any particles with the original type. Wignerberg's postulate that every dyadic also must be an ide, but not necessarily every ide a dyadic, is the starting point of K.'s derivations of the dyadic types and the ide types in a much more generalized understanding. The math. derivation comprises the application of stereo-cryst. symmetry operations (including rotation, symmetry plane, inversion center), and of the infinite translation operations (including screw axis and gliding operations) on the dyadic and ide. The dimension of the extension of these units is essential for their orders: units with 0 linear independent translations are the primitive

(adv.)

above values; in one-dimensional linear translations they form
monodromies; two-dimensional translations, bi-networks;
three-dimensional cases, tri-networks (lattices). Corresponding
decompositions rule the dynamics of different orders.
By the systematic performance of all possible symmetry
operations of all kinds of such dynads and also a complete
enumeration of the possible space-directions to possible
operations, the complete decomposition of the space group C_{2h}^+
is given: In the crystallographic plane (ab) there are 3
different types of network-like dynads, 8 of simple net
dynads; in (ad) are distinguished only 1 kind of network-like
dynads, in (ac) 4 different network-like dynads and 1
type of simple network dynad. The symbols used by K.
are of a new, very handy type, indicating the kinds of the
fundamental translations and other operations, the direc-
tions of these operations, and their orders. In the practical
use of group theory systematic symbols of non-equivalence
relations are given for the general classification of the
resulting phenomena of position changes through opera-
tions. The importance of these general principles for org.
compounds in their crystal structures is evident, and also a
remarkable progress beyond Weissenberg's tables.

W. Ebel

CA

Crystal structures of the naphthylenes. A. J. Kitaigorodskii, Doklady Akad. Nauk S.S.R. 90, 515-17 (1945).--The 3 dimers exemplify structures governed by the tendency to closest packing and by 11-fold forces (1) β -Naphthylenes is monomeric; $a = 8.6$, $b = 9.0$, $c = 16.0$ Å, angle 116°, no. of mols. per unit cell = 4. (Kitaigorodskii) can not be dextr. only for low-order reflections. On that basis, the space group $C_{\bar{1}}$ is probable. The structure is evidently closely related to that of

CuI_2 , with c doubled. The positions of the centers of the mols. are the same in both structures; the orientations of the mols. with respect to the axes is somewhat different; specifically, in naphthylenes, the angles of rotation of the short axis of the mol. around the perpendiculars to the ab plane, of the long axis around a , and of the long axis around b , are, resp., 23, -10, and 34°. (2) α -Naphthylenes crystallizes in the rectangular system with $a = 12$ Å, $b = 9.6$, and $c = 20.3$ Å, thus giving 24 mols. per unit cell. Absence of extinctions of the ab type indicates that the cell is not centered. From rotation patterns around the 3 axes, the only possible space group is $Pna(1D_2)$. The compd. forms in the crystal complexes of 3 mols., and the unit cell consists of 4 "elements" formed by pairs of such complexes, each pair including 6 mols. and possessing a center of symmetry. This peculiar instance of mol. assocn. in the crystal can be linked with the pseudo-heptagonality of the lattice, a pseudohexagonal cell, twice the size of the unit size, with a secondary axis parallel to b , being obtained along the axes [001], [201], and [010]. The crystal can be viewed as built up of hexagonal prisms of the length b and radius 6.7 Å, each prism contg. 6 mols., i.e. one "element" of the unit cell. Within each element, all 6 mols. are oriented with their long axes parallel; in 3 mols. the NH₂ groups are oriented in one direction, in the 3 others in the opposite direction. There appears to be a tendency for primary amine to assume in groups of 3. N. Thus

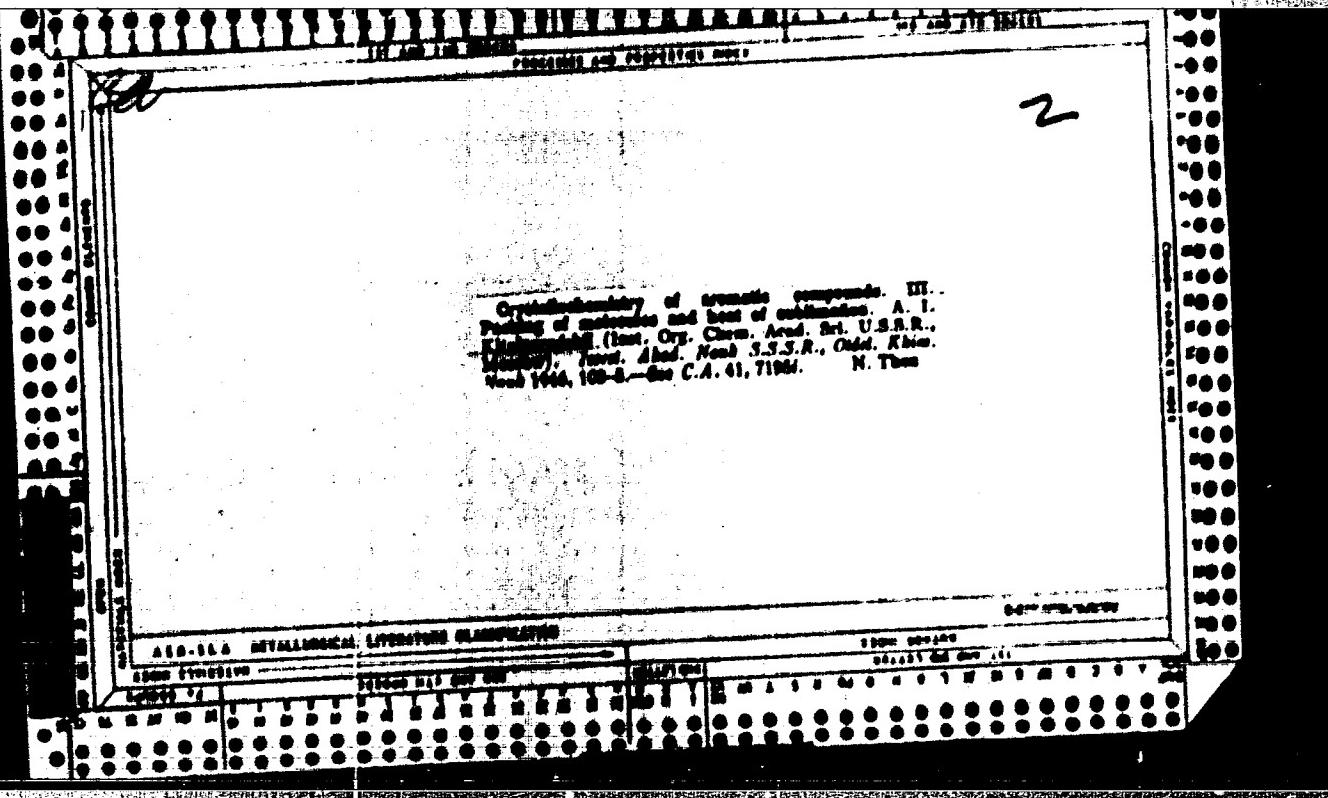
450-114 METALLURGICAL LITERATURE CLASSIFICATION

6.2-17.12.27

KITAYGORODSKIY, A. I.

"The Close-Packing of Molecules in Crystals of Organic Compounds," Zhur. Phys. 351, No. 4, Vol 9, 1945.

Inst. of Organic Chemistry of the AS USSR



crystallized. Crystal structure of β -D-glucopyranose was determined by A. J. Klug¹ (J. Am. Chem. Soc., 1931, 53, 7102-7106; J. Am. Chem. Soc., 1932, 54, 2045-2050) and U. J. S. S. Chakraborty (1956, 687-693 (in Armenian); cf. C. A. 51, 7182). (1) As appears, selection of the orientation of the molecule in a crystal, crystallized lattice can be guided from geometrical considerations. The molec. is represented by an ellipsoid of axes a , b , and c , the half-axes of the cell are A , B , and C . If the c axis forms the smallest angle, α , with the plane xy of the dioxane layer, the projection of the ellipsoid on that plane is $ab = abc \cos \alpha$; geometrical solution of the system of equations for closest packing of ellipsoids in the xy plane gives $ab = AB/\sqrt{3}$; the angles α and β further be calculated from C and a . The constant condition $(ab)^2/(c^2) + (bc)^2/(a^2) = 1/3$ gives the limits of the angle γ between the planes ab and yz (B), by $\tan \gamma = (\sqrt{(b/a)^2 - (a/b)})/(b/a) = (a/b)/(b/a)$ one has $\gamma < (b/a) < (b/a \cos \alpha)$. The method of ratios, as illustrated by the following examples. Naphthalene, known cell dimensions: $A = 1.146$, $B = 2.305$, $c_m = 7.50$ Å, taking $a_1 = 1.72$, $b_1 = 3.46$, $c_1 = 6.1$, one has $b/a = 3.46$, $ab = 7.17$, $\gamma = 28.5^\circ$ (which checks with C), $\gamma = 28.00-28.5^\circ$, in fair agreement with Robertson's (C. A. 26, 647) $\gamma = 28.7^\circ$ and $\gamma = 28^\circ$. Similar agreement obtained in the case of naphthalene, $a = 1.72$, $b = 3.75$, $c = 8.2$, $\gamma = 28.5^\circ$, $\gamma = 28.50-27.90^\circ$; durene, $a = 2.04$, $b = 2.65$, $c = 2.31$, $\gamma = 7^\circ$, $\gamma = 20^\circ$; p -bromonaphthalene, $a = 1.75$, $b = 2.8$, $c = 8.1$, $\gamma = 28^\circ$ (exact 6.0° below the expmt. value), $\gamma = 16-14.5^\circ$ (expmt. 15.7°), and p -bromodurene, $a = 1.72$, $b = 4.8$, $c = 8.1$, $\gamma = 28^\circ$ (expmt. 53.8°), $\gamma = 63^\circ$ (expmt. 67°). Since the deviations between the calc'd. and the expmt. angles do not exceed 8°, the above examples are considered as proof of both the correctness of the method and the accuracy within of the a_1 , b_1 , and c_1 . (2) More precise information on the orientation of the molec. is gained from mod. models (models of a unit of paraffin and rosin), using a helical turned "structure finger" in which the graded one can be rotated by increments.

with the exact. distances between the centers of the molecules, possible mutual orientations, consistent with the requirement of min. distance between atoms of different molecules, the internat. radii of atoms, and with the requirement of closest packing, are tried out. The orientation thus computed with the x-ray structure data, is selected. (3) By x-ray reflection on a rotating crystal, 3,4-dimethyl-
naphthalene has the space group $P\bar{1}c$ ($V^{\frac{1}{2}}$), the cell $a = 7.64 \text{ \AA}$, $b = 6.67$, $c = 23.30 \text{ \AA}$. Using a model built on the assumption of a distance $C(\text{aromatic}) - C(\text{aromatic}) = 1.405 \text{ \AA}$, and $C(\text{aromatic}) - C(\text{aliphatic}) = 1.440 \text{ \AA}$, tried with a set of 8 (as yet imperfect) "directive factors," showed one single possible orientation with regard to the cell axes, characterized (roughly) by the angles $\alpha_1 = 8^\circ$, $\alpha_2 = 3^\circ$, $\alpha_3 = 28^\circ$ (within 1-3'). More precise values of the angles are found by geometrical considerations; the 8 equations describing internat. contacts of atoms, and involving α_1 , α_2 , α_3 , and the internat. atomic radii R_A (H , C , N) and $A_C(H)$ are shown to be solvable only if the angle β between $C(\text{aromatic}) - C(\text{aliphatic})$ and $C(\text{aliphatic}) - H$ (angle HCC of the methyl group) is $\beta = 116^\circ$; the sets give $\alpha_1 = -3^\circ 56'$, $\alpha_2 = 4^\circ 19'$, $\alpha_3 = 23^\circ 46'$, $R_A = 1.19$, $R_B = 1.73 \text{ \AA}$. The structure factors calcd. from these σ agree satisfactorily with the measured intensities. The distortion angles, calcd. from the σ , are as follows: $\alpha_{11} = -0.072$, $\alpha_{12} = 0.908$, $\alpha_{13} = -0.260$, $\alpha_{21} = -0.260$, $\alpha_{22} = 0.040$, and the coordinates x , y , z of C atoms, in fractions of the cell axes, 0.026, -0.074, -0.181; 0.024, -0.199, -0.063; 0.030, -0.167, 0.014; 0.023, -0.204, 0.067; 0.014, -0.126, 0.119; 0.003, -0.204, 0.174. The packing coeff. is 0.718. (4) The agreement with x-ray measurements lends considerable wt. to the values of R , in particular to $R_C(H) = 1.73 \text{ \AA}$ as against the commonly accepted 1.66 \AA . for the half-thickness of the benzene ring. (5) The distortion of the HCC angle $\beta = 116^\circ$ is explained on steric grounds, 116° being the

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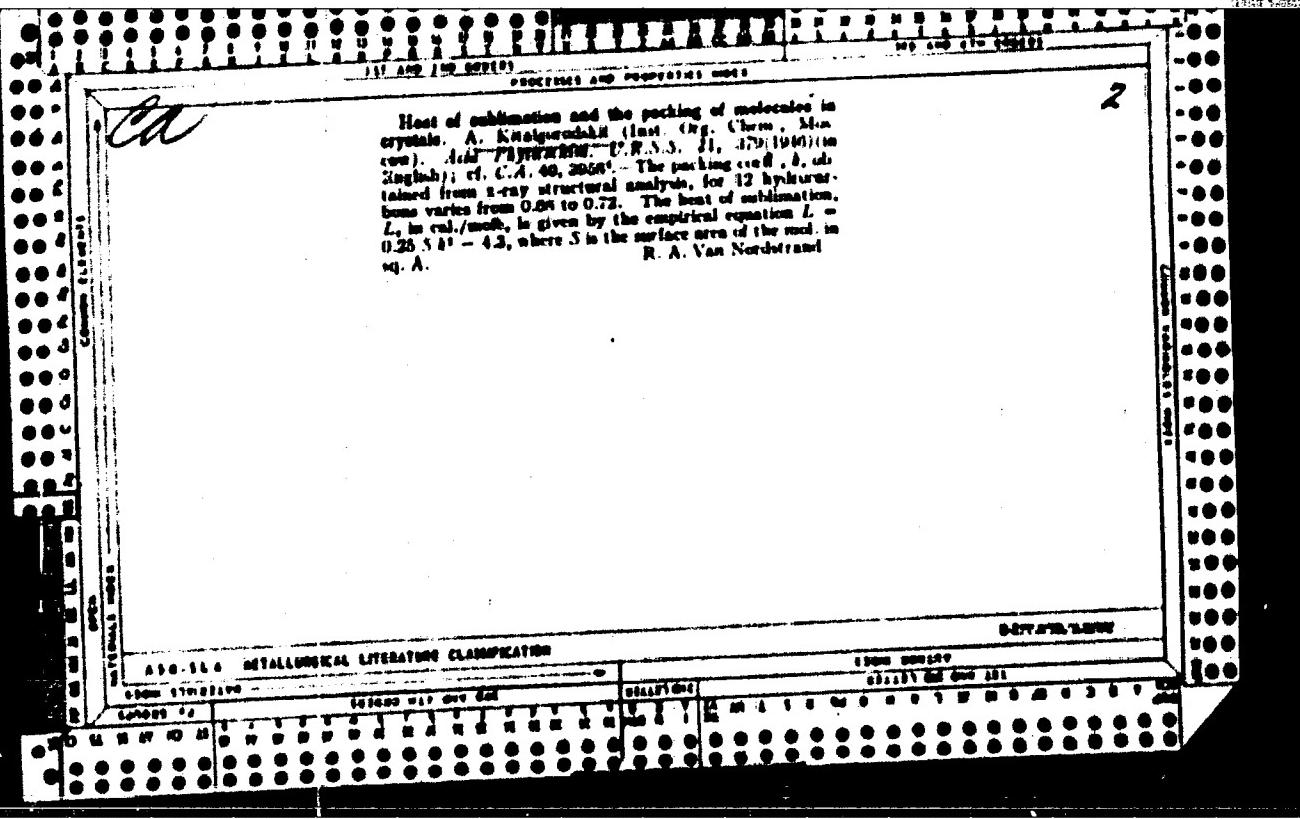
Also: Iz. Ak. Nauk SSSR, Otdel Khim. Nauk.

No. 6, 1956

Inst. of Organic Chem., AS USSR

Each of which, with the given restrictions, overlaps one H atom of the methyl group and the C atom of the benzene ring, causes, and free rotation of the methyl group becomes possible. However, avoidance of overlapping is by no means a general requirement; thus, in Calix, overlapping of C atoms of 2 neighboring methyl group might be avoided if these groups were disposed alternately on 2 sides of the ring, which they are not. In this case, either free rotation is absent, or else the H atoms rotate in such a way that the H atom of the 1st group hate always between 2 H atoms of the 2nd group. But, to speak, it would mean absence of a center of symmetry which is inconsistent with the triclinic crystal form of Calix. 7. Crystal structures of 2- and 3,6-dervatives of naphthalene. *J. Am. Chem. Soc.*, 1947, 69(1), 70(1) (in Russian).—(1) The structure of naphthalene according to Buerger (*J. Am. Chem. Soc.*, 1947, p. 67) does not satisfy the postulates of max. no. of intermolecular contacts between atoms of different molts, with $R_0(C-H)$ 1.72, $R_0(H-H)$ 1.19, and closest position of layers; the distance between a C atom in position 4 and a H atom in position 1 of a neighbor mol. by translation along b , and between a H atom in position 1 and a C atom in position 3 of a neighbor mol. along the glide-plane a should be equal and = 3.80 Å., as in 2,6-dimethylnaphthalene. By the geometrical calcs. outlined above (Part IV), with $C-C$ = 1.41 Å., $C-H$ = 1.05 Å., one finds $\alpha_1 = 27^\circ$, $\alpha_2 = -10^\circ$, $\alpha_3 = 22^\circ 30'$, and for the coordinates x , y , z of the atoms, 0.076, 0.086, 0.238; 0.009, 0.194, 0.308; 0.000, 0.107, 0.091; 0.003, 0.238, -0.004; 0.026, 0.178, -0.204, considerably of variance with B.'s values. This structure deviates only slightly more from B.'s measurements than B.'s own structure and can be held not to conflict with the expt. (2) X-ray diffraction gave, for 2-methylnaphthalene, space group $P\bar{1}/c$, $a = 7.18$, $b = 5.39$, $c = 18.4$ Å., $\beta = 108^\circ 14'$. By geometrical analysis, contact between molts. occurs between H in position 1 and C in position 4; $\alpha_1 = 6.5^\circ$, $\alpha_2 = 5^\circ$, $\alpha_3 = 24^\circ$; C-H groups lie at C in position 3, the distance between the centers of nearest C-H groups = 3.0 Å., and free rotation is impossible. (In contrast to 2,6-dimethylnaphthalene). Layers

are piled up in such a way that the C_6 groups of one layer fall in the middle of the interstices between the C_6 groups of the next layer, ensuring closest possible packing. The distance between the centers of 2 molts. across the C_6 units, is 10.10 Å., and across the H units, 7.78 Å.; this gives $d_{min} = 17.80$, in exact agreement with the expt. 17.80 = 0.10 Å. Amplitudes calcd. from the proposed structures are in agreement with the measurements. (3) X-ray diffraction on 3-naphthalene gave, within ± 0.05 Å., $a = 8.09$, $b = 8.04$, $c = 17.80$, $\beta = 119^\circ 48'$, at variance with the erroneous data listed in *Structural Data* (vol. 1, p. 731). The complete structure can be calculated from purely geometrical considerations, with $\alpha_1 = 37^\circ$, $\alpha_2 = -10^\circ$, $\alpha_3 = 23^\circ$. The essential conclusions are that the H bond between OH groups does not alter the close packing, and that it appears in the form of a double bridge between 2 OH groups, stable at $\alpha = 60^\circ$ and H—H = 1.40 Å., M—O—O = 9.03 Å. The distance C—OH = 1.37 Å. At present, no accurate data could be derived. (4) For 7-naphthalene, no accurate data could be derived. (5) For 2-naphthalene, apparent., $a = 8.4$, $b = 8.0$, $c = 17$ Å., $\beta = 116^\circ$, $\alpha_1 = 34^\circ$, $\alpha_2 = -10^\circ$, $\alpha_3 = 23^\circ$, space group $P\bar{1}/c$. As in the case of 3-naphthalene, the H bond does not interfere with close packing. (6) For 2,6-diphenyl-naphthalene, x-ray patterns give space group $V\bar{1}$ ($F\bar{m}\bar{3}$), $a = 8.34$, $b = 6.28$, $c = 21.36$ Å., 4 molts. in cell. By geometrical analysis, close packing results if the Ph rings are rotated by 53° out of the plane of the naphthalene ring, with the symmetry center of the mol. preserved; the C—C distance linking the naphthalene and the benzene rings is 1.48 Å. The orientation of the naphthalene ring is given by $\alpha_1 = 7^\circ 30'$, $\alpha_2 = 24^\circ 30'$, $\alpha_3 = 27^\circ 30'$. The calcd. structure factors are in agreement with the expt. intensities. (6) For 2,6-dimethylnaphthalene, x-ray patterns give space group $C\bar{1}$ ($A\bar{3}h$), $a = 13.2$, $b = 8.68$, $c = 26.8$ Å., 4 molts. in cell. The structure found by geometrical analysis corresponds to closest possible packing, with the center of symmetry preserved. (7) The common feature of 2- and of 2,6-derivative of naphthalenes is close-packed layers formed by translation along



CA

2

The steric factor in aromatic compounds with unconnected benzene nuclei. A. Kitaigorodskii, *J. Russ. Chem. Society*, 1895, 18, 117; *J. Russ. Phys. Chem. Soc.*, 1895, 21, 570-6 (1946) (in English). In compounds like biphenyl, *p*- and *p*-triphenyl, etc., the *o*-hydrogens are 1.8 Å apart. Since the distance is greater in interned contact, e.g. 2.31 ± 0.01 Å, the steric interaction may draw the atoms much out of their plane. X-ray analyses of 2,6-diphenylheptahelicene and of biphenyl crystals show that in the former the phenyl rings are 25° out of plane, whereas biphenyl is planar. Conclusion: It is less advantageous from considerations of energy for a sub. to leave its symmetry than for the *p*-hydrogens to approach closer than the normal distance. H. P. Kausch

ABSTRACT METALLURGICAL LITERATURE CLASSIFICATION

0-07-278-10002

KITAYGORODSKIY, A.

PA 52768

USSR/Physics

Jul/Aug 1946

Crystallography

Aromatic Hydrocarbons

"The Structure of Dibromanthracene and the C-C Distance in the Aromatic Hydrocarbons," A. Kitaygorodskiy, Inst Org Chem, Acad Sci USSR, Moscow, 2 pp

"Acta Physicochimica URSS" Vol XXI, No 4 - 767-8

Study of the C-C distance in aromatic hydrocarbons by measurements of a dibromanthracene crystal. One of the C-C distances differs essentially from the mean. Doubt expressed regarding validity of the conclusions drawn in a recent study of the structure of coronene by Robertson and White. Received 26 Apr 1946.

72768

also: Dok. AN, 767, No. 4, Vol. 21, 1946, Acad. of Sciences of the USSR, Inst., Organic Chem., Moscow.

KITAYGORODSKIY, A.

PA 24194

DATA/Physics

Crystallography

Aromatic Compounds

Sep/Oct 1946

The Crystal Chemistry of Aromatic Compounds: I,
The Packing of Molecules in Crystals of Organic Com-
pounds," A. Kitaygorodskiy, Inst. Org. Chem., Acad. Sci.
USSR, Moscow, 22 pp

"Acta Physicochimica USSR" Vol. XI, No. 5 - pp. 819-916

Establishes two types of close packing in a layer,
the simple oblique-packed, and "centered" rectan-
gular packing. On basis of symmetry of closely packed
layers, shows speco groups in which they may occur.
Formulates two rules of organic crystal chemistry.

DATA/Physics (Cont'd) Sep/Oct 1946

Checking them against all available experimental data
indicates distribution in a crystal of centrosymmetric
molecules. Received, 16 Aug 1945.

Also: Dok. Ak. Nauk, No. 5, Vol. 21,
1946, AS USSR, Inst. of Organic Chem.,
Moscow.

58594

KITAYGORODSKIY, A.

RA 24124

100-40-B-6

USSR/Chemistry - Aromatic Compounds Nov/Dec 1946
Chemistry - Crystallography

"The Crystal Chemistry of Aromatic Compounds: II, An
Investigation of Two Dicetyl Naphthalenes of Unknown
Structure," A. Kitaygorodskiy, Inst Org Chem, Acad Sci
USSR, Moscow, 8 pp

"Acta Physicochimica URSS" Vol XXI, No 6

Using method of X-ray analysis, unit cells of the
crystals of 2,6-dicetyl naphthalene and di-(2,2,4,4)-
tetramethyl butyl naphthalene were measured, their
space groups determined and intensities of reflections
estimated. Structure of molecule of former determined
and diagram of structure of molecule and crystal drawn
to scale in the paper. Received, 18 May 1946. *sharpi*

KITAYGORODSKIY, A. I.

PA 15T19

USSR/Chemistry - Mercury Compounds May/Jun 1947
Chemistry - Acetylene

"Organometallic Compounds of Mercury: XXXIV, X-Ray
Structural Investigation of $C_2H_2 \cdot HgClBr$," A. I.
Kitaygorodskiy, 6 pp

"Izv Ak Nauk Otd Khim Nauk" No 3

Measurement of the unit cell, determination of the
space group, determination of the arrangement of
 Hg , Cl and Br atoms by the Patterson series, and
consideration of the arrangement of light atoms by
geometrical analysis.

15T19

*1837. Determination of the Maximums of the Fourier Series in Structural Analysis. (In Russian.) A. I. Kitaigorodskii. *Journal of Technical Physics* (U.S.S.R.), v. 17, Sept. 1947, p. 1003-1010.

Accuracy of the method of series is analyzed and a new formula permitting determination of probable error in location of atom centers is set up. Several practical applications of the method are indicated.

3.2

3

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

The properties of amorphous Li_2SiO_4 have been studied by P. J. Flory, C. S. Marvel, and R. L. Williams (J. Am. Chem. Soc., 1940, 62, 7304) by means of X-ray diffraction. The structure is shown to consist of two crystallographic groups, one of which is the same as that found in the mineral leucophane. The other group consists of two Li_2SiO_4 units, one above the other, with the silicon atoms in the upper group situated between the two lithium atoms in the lower group. The two structures agree with E. J. Sorenson's rules for the crystallographic properties of silicates.

2

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

KITAIGORODSKI, A.

PA 720

USSR/Crystals - Structure
Crystals, Organic

Feb 1947

"The Crystal Chemistry of Aromatic Compounds: III,
The Packing Coefficient in Organic Crystals," A.
Kitaigorodski, 10 pp

"Acta Physicochimica" Vol XXII, No 2

The author defines the packing coefficient of molecules as $k = \frac{vZ}{V}$ where V is the volume of the unit

cell of the crystal, Z the number of molecules in a unit cell, and v the volume of the molecule, i.e., the volume of the space confined within the spheres of intermolecular radii drawn from the centers of the atoms.

9120

KITAYGORODSKIY, A.I.

PA 50791

~~Classification~~

Crystalllography

Twining

N. V. Belov's Book, "Structure of Ionic Crystals and Metallic Phases", A. I. Kitaygorodskiy, 2 pp

"Uspishi Fiz Nauk" Vol XXXII, No 1

JAN 1947

Reviews 236-page book, with 174 illustrations, published by Academy of Sciences, USSR, 1947. Can be considered continuation of work carried out by Fedorov. Shows possibility of studying all crystals from one viewpoint: 1) symmetry of plane packs; 2) spaces between plane packs; 3) structural motives of Al_1 , Al_2 , etc.; 4) structures with coordination

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50791

USSR/Physics (Contd)

Jan 1947

numbers 8 and 12; 5) porosimetry and twinning; and 6) new structures, based on the principle of plane packs.

50791

KITAYGORODSKIY, A.I.

USSR/Physics
Molecular Structures
Academy of Sciences

Feb 1947

"M. V. Vol'kenshteyn's Book, 'Structure of the Molecule', " A. I. Kitaygorodskiy, 1 p

"Uspokhi Fiz Nauk" Vol XXXIII, No 2

Vol'kenshteyn intended to interest student as well as physicist in structure of the molecule. In spite of shortcomings and some rather obvious mistakes pointed out by reviewer, book is noteworthy contribution to Soviet science. Published by Academy of Sciences as "Scientific Research Journal, Monograph Series," 1947, with 270 pages, 193 illustrations, and 49 photographic plates.

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KITAYGORODSKIY, A. I.

USSR/Chemistry - Organic Compounds
Chemistry - Crystals

Oct 1947

"Principles of Organic Crystallochemistry," A. I.
Kitaygorodskiy, Inst Org Chem, Acad Sci USSR, 2 pp

"Dok Akad Nauk SSSR" Vol LVIII, No 1

Principle of solid packing limits symmetry of distribution of molecules in crystal. Formulates law of crystallochemistry: crystals of organic compounds can be looked upon as a system with a very solid form of packed layers. Molecules of the layer have a coordination number of 6 and are so distributed that there is no polarity to a perpendicular layer. Submitted by Academician A. N. Nesmeyanov, 21 Mar 1947.

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Crystallography of aromatic compounds. VI. Space groups of crystals of organic compounds. A. J. Alexander and G. W. Brindley. Acta Cryst. 1964, 19, 378-89; idem, C. R. Acad. Sci. Paris 1964, 268B-29; idem, C. R. Acad. Sci. Paris 1964, 268B-30. (1) The principle of closest packing is reformulated to state that crystals of org. compds. are systems of closely packed layers of mols. of coordination no. 6 and disposed in such a way that no polarity exists perpendicular to the layer. This is based on the postulate that no org. mol. in the crystal assumes a definite shape, and that the requirement of closest packing is predominant. Of the 40 space groups derived by Alexander and Narinsen (G. Z. Kristallogr., 79, 228 (1930)), 20 must be eliminated because of the incompatibility of quadrilateral and trigonal lattices with close packing. Of the remaining, all but the 19 groups C₁, C₂, C₃, C₄, C₅, C₆, C₇, C₈, C₉, V₁, V₂ are eliminated by the requirement that in order to achieve closest packing, the axis of the mol. must be oriented at any angle to the axes of the cell; this requirement actually excludes groups in which binary axes lie in the plane of the layer, groups with symmetry planes perpendicular to the layer, and groups for which the plane of the layer coincides with the glide plane. Analysis of the modes of superposition of layers consistent with the requirement of close packing leads to the formulation of the space groups in which mols. of a given symmetry will preferentially crystallize. The following table gives, for each mol. symmetry, the probable (or the possible) space group, dyadic symbol, no. of mols. per unit cell, and no. of monolayer layers (i.e.

not related by a symmetry operation). Mol. symmetry: 1; probable groups C₁ = P₁(1), S₂(1), 4, 1, 1; P₂(1), S₂(1) or S₃(1), 3 and 4, 1 and 2; P₃ = P₁(3), 2, 1, 1; P₄(1), 4, 1; C₂ = 1, 1(1), 3 and 4, 1 and 2; C₃ = P₁(3), S₂(1) or S₃(1), 4, 1; probable S₄(1), 4, 1; C₄ = P₁(4), S₂(1) or S₃(1), 4, 1; C₅ = A₂; probable P₅ = P₁(5), 2(1) or 2(2)(1), 4, 1; C₆ = A₂(1), 4, 1. Mol. symmetry 2/m: probable groups same as for 1; probable groups P₆ = P₁(6), 2(1), 4, 1; C₇ = P₁(6), 2(1), 4, 1; C₈ = P₁(6), 2(1), 4, 2; C₉ = C₁, 2(1), 4, 1; probable 2/m, 222; probable groups same as for 1; probable groups V₁* = P₁(6), S₂(2) or S₃(2), 4, 1; probable groups C₁₀ = P₁(10), 2/m, 222; probable groups C₁₁ = A₂(1), 3 and 4, 1 and 2; P₁₁ = P₁(11), 2(1), 4, 1; C₁₂ = 1, 1(1), 1 and 2, 1 and 2; probable groups C₁₃ = A₂(2), 2(1), 4, 1; V₂ = P₁(6), S₂(1) or S₃(1), 4, 1. The tendency to max. lattice symmetry, although it often takes precedence over the requirement of closest packing, may result in a greater frequency of groups designated as "possible." With regard to the relation between the symmetry of a mol. and its symmetry in the crystal, the available data lead to the following partial conclusions. A mol. of symmetry m or 2/m has in the crystal a symmetry center and only that; a mol. of symmetry m or other has all its symmetry elements or keeps the symmetry m or 2; mols. of symmetry = usually have their symmetry in the crystal; plane mols. possessing a symmetry plane passing through all the atoms, always lose that symmetry in the crystal. A no. of mols. per unit cell higher than that indicated in the table given, represents (and de-

(cont.)

410-164 METALLURGICAL LITERATURE CLASSIFICATION

410-164 METALLURGICAL LITERATURE CLASSIFICATION		410-164 METALLURGICAL LITERATURE CLASSIFICATION	
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4100-16400	4100-16400	4100-16400	4100-16400
4100-16400	4100-16400	4100-16400	4100-16400

lines) and, assess, in the crystal and supply information about the symmetry of the layer. (3) The correction of the foregoing conclusions is illustrated by a survey of available data, with the admittedly possible exception of inorg. compounds, with org. radicals and of salts of org. bases. Beyond that, 11 literature instances of structure data, of org. compounds, which appeared to conflict with the principles stated under (1) are shown to be erroneous, and are replaced by new empd. structure data, or the author, with the result that the conflict is resolved. The following list gives the complete, the reference of the structure data, considered to be erroneous, and the newly deduced structure data. 2,4,6-Triisopropylbenzene (Hertel and Bömer, C.A. 27, 2820) monoclinic; taking the width of the plate as the direction of the c axis, the cell is $a = 11.10 \pm 0.04$, $b = 6.03 \pm 0.03$, $c = 14.05 \pm 0.04$ Å., $\beta =$

$126^\circ 10'$, $a = 4$, space group $C_{2h} = P\bar{3}c$, no systematic extinctions of the $h0l$ type; N.'s measurements appear to be correct, his interpretation erroneous. ρ -Nitrobenzene (Praed and Mervin, C.A. 22, 42227), $a = 6.45 \pm 0.03$, $b = 14.30 \pm 0.04$, $c = 13.71 \pm 0.04$ Å., space group $V1' = P\bar{3}m$. ρ -Phenylenediamine (Casper, C.A. 22, 210), monoclinic, $a = 8.46$, $b = 6.03$, $c = 23.3$ Å., $\beta = 93^\circ$, space group $C_{2h} = P\bar{2}1/c$ and not C_{2h} . Anisophthaleic (Strachan-Wright, I.), $a = 7.34 \pm 0.03$, $b = 7.39 \pm 0.03$, $c = 19.7 \pm 0.1$ Å., group $V1' = P\bar{3}m$. Anthroline acid (Praed and Kapila, C.A. 26, 42209), $a = 9.4$, $b = 10.8$, $c = 18.0$ (all ± 0.04 Å.), group $C_{2h} = P\bar{3}m$. Catechol (Casper, C.A. 26, 2101) $a = 11.04$, $b = 8.46$, $c = 10.18$, $\beta = 118^\circ$, $a = 4$, space group $C_{2h} = P\bar{2}1/c$. σ -Nitrobenzene (Hermann and Burak, C.A. 22, 2802) para-derivative monoclinic, $a = 8.8$, $b = 10.0$, $c = 20.8$ Å., $\beta = 93^\circ$, base centered, probable space group $C_{2h} = P\bar{2}1/c$. Dianisobenzene (Hoendersma and Hillebrand, C.A. 26, 708); the data are correct with respect to the extinctions, but analysis of the intensities leads to the space group $C_{2h} = P\bar{3}m$, not $P\bar{3}m$. 4-Anisopropyl (Ochiai, C.A. 22, 46579) monoclinic, $a = 10.35$, $b = 3.98$, $c = 7.93$ Å., $\beta = 102^\circ 43'$, $\beta = 3$ (in agreement with Sato, C.A. 34, 87167), group $P\bar{2}1/c$. Anisophthaleic (Boseyjra and Singh, C.A. 21, 44407), space group C_{2h} not $V1'$. m -Phenylenediamine (Casper, C.A. 22, 210) monoclinic, $a = 8.23$, $b = 13.82$, $c = 23.3$ Å., $\beta = 93^\circ$, space group $P\bar{2}1/c$. N. Then

CA

2

Crystal structure of diphenylmercury. A. I. Kitaigorodskii and D. N. Ordzhonikidze. *Bull. Acad. sci. U.R.S.S.*, Chem. ser., 1948, 302 (in Russian). — X-ray exams. of Ph₂Hg crystals give $a = 10.75 \text{ \AA}$, $b = 8.20 \text{ \AA}$, $c = 8.39 \text{ \AA}$, with vol. of elementary cell 696 \AA^3 , 2 mols. per cell. Space group is C₂ with the Hg atom at the center of symmetry in the crystal. The C-Hg-C angle appears to be 180° with Ph rings in the same plane. O. M. K.

Also: Iz. Ak. Nauk SSSR, Otdel. Khim. Nauk No. 2, 1948

Inst. Organic Chem. AS USSR

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

A

X-ray structure analysis of organic compounds. A. I.
Kitaigorodskii. Izdatelstvo Akademii Nauk SSSR
[and review, largely summary of the author's work]
[by] [unclear]

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

Posing of molecules in crystals of organic compounds
A. I. Kitaigorodskii. Izv. Akad. Nauk SSSR, 1958, No. 12, p. 2226
(1959). (Briefed expansion of the principles and results
of the author's own work (C.A. 52, 6197g). 15 references
N. Toma

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKIY, A. I.

"Review of W. T. Sproull's Book 'X-rays in Practice'." Uspekhi Fiz. Nauk 35,
No. 1, 1948.

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKIY, A. I.

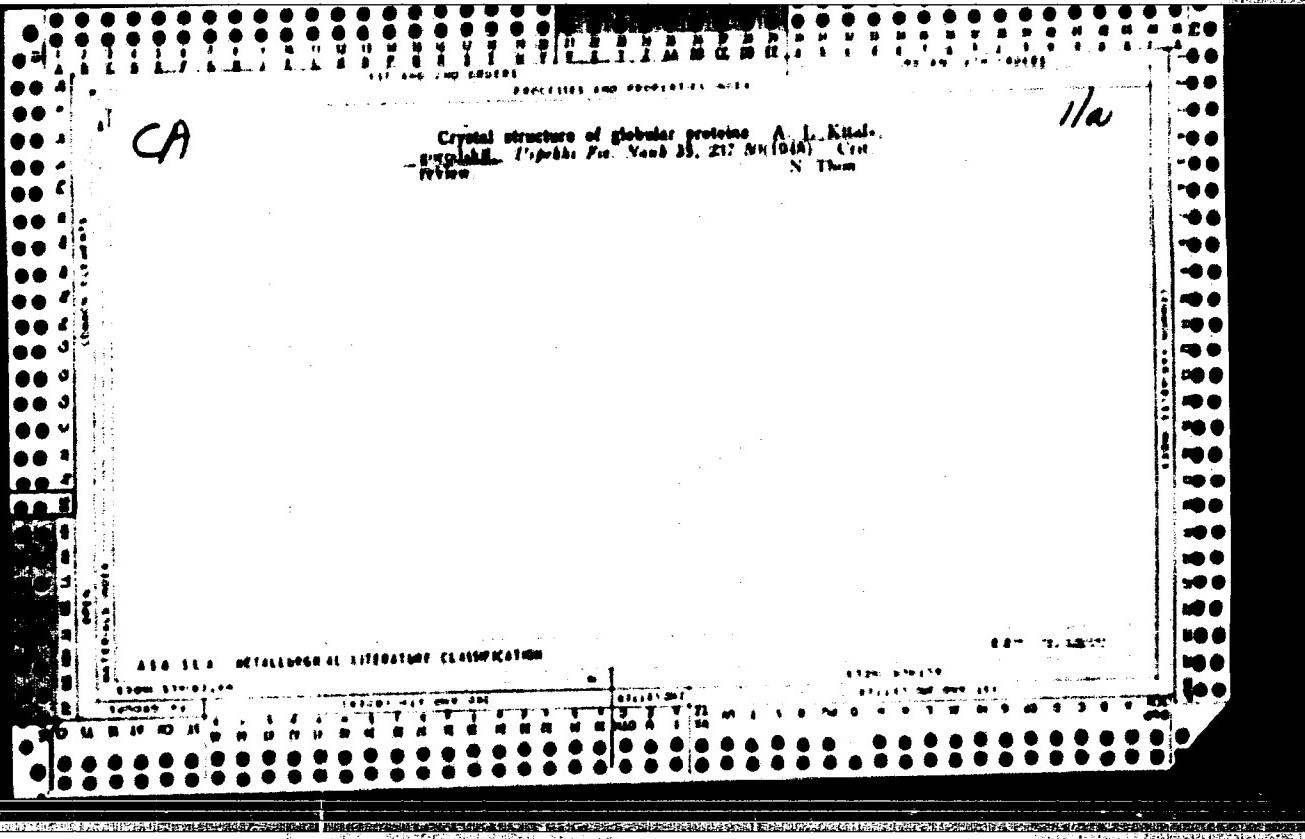
"Review of N. D. Papaleksi's Book 'Course in Physics, Vol 2,' Uspekhi Fiz. Nauk
35, No. 2, 1948.

APPROVED FOR RELEASE: 09/17/2001

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"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKIY, A. I.

"Measurement of Roentgen Dispersion Caused by a Monocrystal with the Aid of a Geiger Counter," (British). Uspekhi Fiz. Nauk 36, No. 4, 1948.

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

KITAYGORODSKIY, A. I.

"The Structure of Matter," Nauka I Zhizn' No. 4, USSR, 1949.

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

Crystallography of aromatic compounds. VII. Pseudo-symmetry of the infrared structure of aromatic and some organic compounds (anisole, α -naphthalene, γ -hydroquinone). A. I. Kitaigorodskii [Zhur. Org. Khim., Arkh. Art. 17 A.B.N. (Moscow), Izdat. Akad. Nauk S.S.R., Chisl. Klass. Nauk 1960, 2nd ed.; cf. C.A. 53, 2000].—Although the symmetry of a crystal does not, generally, the x-ray extinctions, information as to symmetry based on the observation of extinctions in ν -ray, along with a probable symmetry, also further pseudo-symmetry classes. Relations (1) for $\delta \neq 0$ in a noncentric crystal of the class $\bar{1}$, indicate a pseudo-symmetry axis, with a point $x, \frac{1}{2}, z$, corresponding to each point x, y, z , but the possibility is left open for a group whence a point $x + a, \frac{1}{2} + y, z + b$, corresponds to a point x, y, z . This latter relation is termed a "pseudo-axis." In an analogous way, a pseudo-slip plane, perpendicular to the b axis, is defined by the correspondence $\frac{1}{2}, x + a, \frac{1}{2} + z \leftrightarrow x + y + z$, where, again, a can have any value; even though this relation does not correspond to a true symmetry, it will give rise to extinctions $\Delta\ell$ at $\delta + l \neq 2a$ typical for the slip plane. A pseudo-center of symmetry can be defined if the points of a cell are divided into 3 groups, each of which forms a centered lattice of its own, e.g., with the correspondence $x, y \rightarrow x + \frac{1}{2}, y + \frac{1}{2}, z$, and $x, y, z \rightarrow x + \frac{1}{2}, y, z + \frac{1}{2}$; this results in extinctions $\Delta\ell$ on condition that both $\delta + \delta \neq 2a$ and $\delta + l \neq 2a$. The application of the concept of pseudo-symmetry is illustrated by the following 2 examples: (1) Anisole: orthorhombic, $a = 0.3$, $b = 14.0$, $c = 7.3$ Å, 4 mols. in the cell, extinctions $\Delta\ell$ at $l \neq 2a$ and $\delta \neq 2a$. The pseudo-symmetry

is $\bar{1}$; here it was assumed a pseudo-axis A . Further possible symmetry groups are $\bar{1}\bar{1} = P_{1}\bar{1}m$, $\bar{1}\bar{3} = P_{1}\bar{3}m$, and $\bar{1}\bar{1} = P_{1}\bar{1}m$. By the principle of close packing, and by considerations of geometry and dimensions, the last and 3rd possibilities appear excluded. A symmetry $\bar{1}\bar{1}$ with a simple symmetry axis along a and a pseudo-slip plane perpendicular to a is permissible on consideration of geometry, but is invalidated by the analysis of intensities, the Patterson series on the ab plane having but one marked max at $\delta = 0.044$, not at 0.21 and 0.17. This leaves only the possibility $\bar{1}\bar{3}$, with max. occupying 3 mirror planes and related by symmetry, which gives rise to a pseudo-extinction $\Delta\ell$. (2) α -Naphthalene, $a = 12.0$, $b = 4.20$, $c = 12.4$ Å, $\delta = 117^{\circ} 47'$, 4 mols. in the cell, extinctions $\Delta\ell$ at $\delta \neq 2a/420$, 040 at $\delta \neq 2a$, and 040 at $\delta \neq 2a$. The latter indicates a pseudo-symmetry plane, perpendicular to a with slip along a , and a true space group $P2_1/a$. The pseudo-symmetry is possible only if the center of the naphthalene ring lies at $x = 0.58$, $y = 0$, the origin being the inversion center of the crystal. The O atom must lie on the same line as the center of the ring. The structure is completely characterized by the coordinates of the mol. center 0.583 $a/2$, and the Euler angles $\phi_1 = 34$, $\phi_2 = 63$, $\phi_3 = 78.8^{\circ}$. (3) γ -Hydroquinone, monoclinic variety (obtained by sublimation of the rhombohedral form through filter paper) $a = 12.2$, $b = 8.18$, $c = 8.08$ Å, $\beta = 107^{\circ}$ extinctions (at variance with Caspari, C.A. 21, 2400) 000 , 001 , and 000 , at δ, l , and $\delta + l \neq 2a$; $\Delta\ell$ at $\delta \neq 2a$; $0M$ at $l \neq 2a$; $\Delta\ell$ at both $\delta + \delta \neq 2a$ and $\delta + l \neq 2a$. The 4 mols. of the cell must be so distributed that in the projection perpendicular to b repetition occurs.

Inst. of Organic Chemistry, AS

every $\sqrt{2}$, in the projection perpendicular to a every $\sqrt{2}$, and there be a pseudo-center with part of the atoms covering at, the other part at, by the dimensions of the cell, the O_2 axis should be close to the a axis of the cell. These requirements are met by a structure with the centers of the benzene rings lying at 000, $1/2, 0, 1/2, 0, 1/2$, i.e., these centers form a centered cell. The division into 2 groups called for by the pseudo-center can be performed only in one way, namely 1 group involving the ring, the other the OH groups. If the latter were to lie on the line passing through the diam. of the ring, it would mean a true symmetry center, in conflict with observations. The only possible distribution is with the OH groups centered at, the ring, etc. The O—O line does not pass through the diam. of the ring. The extinctions $M\bar{M}$ at $\lambda = 2\pi$ and 000 at $\lambda = 2\pi/2n$ correspond to true symmetry elements, and the true space group is $P\bar{A}/c$ with 4 mols. occupying in pairs unoccupied points of inversion centers in the plane $s = 0$ and $s = 1/2$. The O atoms must deviate from the diam. of the ring by at least 0.3 Å, i.e. the angle of the C—O bond is not less than $11-12^\circ$; some deviation of that inclination may however be due, by a shift of the center of the electron cloud relative to the surface of the O atom, but that shift cannot amount to 0.3 Å. N. Then

NITAYGOROD SKYY

The Structure of Acenaphthene, and Certain Problems in Relation to the Method of X-Ray Analysis (original text in Russian).
A. V. Kitaigorodskii. Russ. Chem. News Sup '69 (2) 9
Moscow 1969, 1969, 9 pages, 11 ill.

Acenaphthene crystallizes in a spatial group of $C_{2h}^1 = Pcm\bar{3}$, with four molecules in the nucleus whose dimensions are $a = 0.3$; $b = 13.86$; $c = 1.3$ Å. The structure of acenaphthene is composed of two layers of molecules not interconnected with symmetrical operation. The symmetrical line of molecules lies on the surface of the crystal symmetry. The mole-ratio of acenaphthene is flat, the distance between the groups of C_{2h} equals 1.64 ± 0.4 Å, and the width of benzene nucleus equals 1.35 ± 0.1 Å. The increase in comparison with the normal single C-C compound should be explained by the considerable tension present in the molecule. The reduction in width of the benzene nucleus down to 0.68 Å apparently is also connected with these tensions. An assumption should be made that the

organic molecule of the system is more flexible than required. The normal intervals for single and double-bonded compounds are accomplished only in simple structures not under tension. According to this it should be mentioned that the structure of naphthalene determined in relation to heteroatomic species is very inaccurate. It is also known that in naphthalene itself the benzene-nuclei can be investigated only in first approximation as normal hexagons with a radius of 1.4 Å.

A 10 10 A DETAILED PHYSICAL LITERATURE CLASSIFICATION

CA

Crystalline structure of mercury allyl halides. I. N. (Vedernikov and A. I. Krikunovskii, *Zhur. Fiz. Khim.* 23, 1161-71 (1949); cf. C.A. 33, 7776a)—several x-ray methods applied to 0.03-cm thick plates of complex prep. according to Shultz and Jorrell (C.A. 33, 1870) gave for tetragonal HgCl_3 , EtHgCl_2 , EtHgBr , and PrHgCl (all tetragonal to space group $D_{4h}^5 = P\bar{4}cm$) a and c 4.08 and 9.30, 4.15 and 10.55, 4.80 and 10.82, and 4.70 and 13.05 Å, resp., and for rhombohedral HgCl_3 (C_3 — $P\bar{3}m$) a 4.10, b 5.34, and c 18.16 Å. In the tetragonal crystals, Hg, halogen, and the center of the allyl radical are situated on the quaternary axis. The ordinates of Hg are 1.20, 1.31, 1.35, 1.35, and 1.36 Å, resp. The Hg-Cl, Hg-Br, and Hg- C_2 distances are 2.60, 2.61, and 2.66 Å, all ± 0.05 Å. The Me, Et, and Pr radicals seem to rotate about the c axis, but the rotation must be synchronized to avoid rotation. I. I. Bilevman

KITAYGORODSKIY, A. I.

"Review of Ch. S. Barrett's 'Structure of Metals (Crystallographic Methods, Principles and Data)'. Uspekhi Fiz. Nauk 37, No 2, 1949.

KITAYGORODESKIY, A. I.

"Review of V. P. Tarasova and M. P. Shaskol'skaya's Translation of M. Burger's Book, 'Roentgen Crystallography'." Uspekhi Fiz. Nauk 37, No. 3, 1949.

KITAGORODSKIY, A. I.

"The Fundamentals of Organic Crystallochemistry," received a D.I.Mendeleev Prize for 1946 and 1949.

Vestnik AS USSR 3/50
N-12748

KITAYGORODSKIY, A. I.

PA 103190

USSR/Physics - X-Ray Analysis
Crystals

Apr 50

"Accuracy of Roentgen-Structural Analysis of Crystals," A. I. Kitaygorodskiy, Inst of Org Chem Acad Sci USSR

"Zaur Tekh Fiz" Vol XX, No 4, pp 397-411

Kitaygorodskiy analyzes problem of accuracy of determination of values of electron density and coordinates of centers of atoms in crystals. He introduces formulas giving error of these quantities as functions of the nature of the structure

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USSR/Physics - X-Ray Analysis (Contd) Apr 50
and conditions of the experiment. Includes procedures for executing X-ray analysis. Submitted 14 May 49.

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KITAYGORODSKIY, A. I.

IA 170799

USER/Physics - X-rays
Book Report

Mar 50

"M. Burger's Book, 'X-ray Crystallography,'"
A. I. Kitaygorodskiy

"Uspekhi Fiz Nauk" Vol XXXVII, No 3, pp 401-4

Book report of the Russian translation, by V. P.
Taranova and M. P. Shaskol'skaya under editor-
ship of M. M. Umnanskiy, from subject English-
language book. Printed at Moscow 1948 by State
Publishers of Foreign Lit; 484 pp, 252 fig.

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KITAYGORODSKIY, A.

168787

USSE/Physics - Molecules
Mechanics

Aug 50

"Review of V. I. Pavlov's Book, "Physics Course,"
Volume I," A. Kitaygorodskiy

"Uspekhi Fiz Nauk" Vol XLI, No 4, pp 565-569

Subject volume (published 1959, Gostekhizdat, 447 pp,
160 figures) is devoted to mechanics and molecular
physics. Part I is a chapter on hydrodynamics and
aerodynamics; Part II consists of 9 chapters, mainly
on molecular kinetic theory of structure of matter.

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CA

13

New facts on interatomic distances in aromatic compounds. A. I. Khalgrenskii and S. N. Kostikov (Inst. Eng. Chem., Acad. Sci. U.S.S.R.), Zhurnal Akad. Nauk SSSR 71, 700-800 (1961). — The accepted view that, in aromatic compounds, all C-C distances are equal (1.41 ± 0.02 Å), is refuted by new data on the structures of 1,3-dichloronaphthalene (I) and 1,3-dichloranthracene (II). In I, monochloro, space group C_{2h}^1 , $A2/a$, $a = 13.00$, $b = 4.10$, $c = 14.2$ Å, $\beta = 92^\circ 40'$, axes of nodes in the cell are orientations of the mol. relative to the axes of the cell: $\phi_1 = -34^\circ 40'$, $\phi_2 = 21.5^\circ$, $\phi_3 = 73.5^\circ$; the C-C distances are $C_1-C_2 = 1.32$, $C_3-C_4 = 1.40$, $C_5-C_6 = 1.32$ and $C_7-C_8 = 1.34$ Å. In II, monochloro, C_{2h}^1 , $A2/a$, cell constants: $a = 19.0$, $b = 4.05$, $c = 14.4$ Å, $\beta = 93^\circ 10'$, axes of nodes: 4, orientation $\phi_1 = -20^\circ 20'$, $\phi_2 = -24^\circ$, $\phi_3 = 75^\circ$, $C_1-C_2 = 1.40$, $C_3-C_4 = 1.37$, $C_5-C_6 = 1.44$, $C_7-C_8 = 1.32$, $C_9-C_{10} = 1.30$, $C_1-C_9 = 1.32$, $C_2-C_{10} = 1.42$. Obviously, the double bonds, characterized by the distance 1.31-1.34 Å, are to a large extent localized, and the single-bond distance is shortened. There is no over-all averaging of the bond distances as predicted by quantum-mech. valence. — Then

"APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7

UMANSKIY, Ya. S., TRAPEENIKOV, A. I. and KITAYGORODECKIY, A. I.

Rentgenografiia (X-Rays Applied to the Industry), 310 p., Moscow, 1951.

APPROVED FOR RELEASE: 09/17/2001

CIA-RDP86-00513R000722920002-7"

KITAYGORODSKY, A. I.

PA 18787

18787

USER/Physics - Crystalllography Mar/Apr 51

Mar/Apr 51

"Analyzing the Results From the Structural Investigation of Crystals," A. I. Kitaygorodskiy, Inst of Org Chem, Acad Sci USSR

*Iz Ak Nauk SSSR, Ser Fiz" Vol XV, No 2,
pp 157-163

Results of structural investigations clarify the position of atoms in the elementary structural unit. The accuracy with which the coordinates of the "centers" of atoms are detd has recently become the object of detailed investigations and discussions. Inter-atomic distances

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USER/Physics - Crystallography (Contd) Mar/Apr 51

or complex structures have been detd with accuracy up to 0.01 \AA in the best cases and 0.05 \AA in others, by the complete use of all possible intensities of the reflected rays. Author discusses static interaction (hindrance), flexibility of the valence angle, and analysis of the forces. Kitaygorodsky's lecture was discussed by the following persons: V. I. Kastochkin, Moscow; G. S. Zhdanov, Moscow, and N. V. Belov, Moscow; the latter², in opposition to the 1st, agrees that Kitaygorodskiy has proposed a new method for the analysis of structure. Submitted at 3d All-Union Conference on Use of X-rays in Study of Materials held 19-24 Jun 50 in Leningrad.

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....., A. I.

PA 187T90

Physics - X-ray Analysis, Crystalllographic

Mar/Apr 51

"Determination of Chemical Formulas by the Method of Roentgeno-Structural Analysis," A. I. Kitay-Gorodskiy, Yu. T. Sturzhikov, Inst of Org Chem, Acad Sci USSR

"In Ak Nauk SSSR, Ser Fiz" Vol XV, No 2, pp 176-178

Authors have X-rayed hundreds of chem compds during the 38 years of the existence of roentgeno-structural analysis. Their main efforts have been directed toward detg the distances between atoms in molecules and crystals. In most cases the chem formula

Chem/Physics - X-ray Analysis, Crystalllographic (Contd)

187T90

can be detd by subject method if some orienting data is 1st known, as in the case of penicillin. Submitted at 3d All-Union Conference on Use of X-rays in Study of Materials held 19 - 24 Jun 50 in Leningrad

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